DOCUMENT RESUME

ED 289 088 CG 020 354

AUTHOR Belford, Susan; Gibbs, Margaret
TITLE Subject Reaction to Human-Caused and Naturally-Occurring Radioactive Threat.
PUB DATE Apr 87
NOTE 12p.; Paper presented at the Annual Meeting of the Eastern Psychological Association (Arlington, VA, April 9-12, 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adults; *Attribution Theory; Comparative Analysis; *Emotional Response; *Environmental Influences; Hazardous Materials; *Poisons; Safety; *Waste Disposal; Wastes
IDENTIFIERS Radon

ABSTRACT

While research has shown that people are adversely psychologically affected by knowledge that their communities have been toxically contaminated, it has been suggested that those who see a disaster as naturally occurring tend to be less adversely affected than those who see a disaster as caused by human acts. To examine this issue, questionnaires were collected from 73 residents of Warwick, New York. Warwick residents potentially faced toxic contamination from both a natural occurrence (radon released by underground deposits of uranium) and a man-made problem (a plan to dump radioactively contaminated soil in the bordering town). The results revealed that respondents viewed the dumped toxic as more dangerous than the naturally-occurring toxic and were both more aware and more concerned about the dump situation. They also rated government handling of the dump as poorer than government handling of the radon problem. Subjects also differed in their emotional reactions to the two dangers, checking more total emotions in relation to the dump than to the natural radon and feeling more anger about the dump than about the natural radon. These findings support the hypothesis that perception of human causation leads to greater distress and anger than does perception of natural causation of toxic contamination. (NB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED289088

Subject Reaction to Human-Caused and Naturally-Occurring Radioactive Threat

Susan Belford and Margaret Gibbs, Ph.D.

Fairleigh Dickinson University

CG 020354

Paper presented to the Annual Convention of the Eastern Psychological Association, April, 1987, in Arlington, Virginia.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Margaret Gibbs

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

TITLE OF PAPER: Subject Reaction to Human-Caused and Naturally-Occurring Radioactive Threat

TOPICAL SESSION PREFERENCE: 'Environmental Psychology

PROBLEM OR MAJOR PURPOSE: Psychological research on the effects of toxic contamination have shown that people are adversely psychologically affected by knowlege that their communities have been toxically contaminated (Gibbs, 1986; Baum, Gatchel & Schaeffer, 1983). Specific psychological effects which have been linked to toxic exposure include depression (Gibbs, 1986), and a growing distrust of government (Levine, 1982).

A mediating variable of victim's reactions to toxic contamination is whether or not they can specify a causal agent of their misfortune. It has been suggested that those who see a disaster as naturally caused tend to be less adversely affected than those who see their troubles as caused by human acts. The former group is more likely to accept their situation as an unfortunate inevitability, while the latter tend to feel angry and distrustful toward the perceived causal agents (Edelstein, 1986). Such conclusions are generally made from group comparisons and integration

of findings across studies. It is not generally possible to find a group of people who have been or may be exposed to two similar hazards, one of which is naturally-caused and one of which is human-caused.

A situation of this kind exists for the residents of Warwick, New York. This town is in a region with underground deposits of uranium. When this substance decays it releases radon, a radioactive gas, which can become trapped in homes, releasing further radionactive products. Some researchers feel that radon in homes and buildings is one of the chief causes of lung cancer. Residents can determine whether or not radon gas is a problem in their homes by having them tested. It is likely that most households however have not been tested and thus occupants could view themselves as potentially at risk. This situation received wide media coverage beginning about four months before this study. At the same time, Warwick residents have been threatened with another source of environmental hazard. Plans have been made to dump radioactively contaminated soil in the bordering town. Warwick residents fear that this will lead to radioactive contamination of their shared water supply and thus to potential health hazards.

Area residents have formed active protest groups, and much publicity has focused on the issue.

These two hazards are similar in that both involve potential radioactive exposure with accompanying health risks. Another similarity is that regarding both situations, the majority of residents did not know if they were or would be exposed to the toxic. The main difference of interest between these situations which was hypothesized to be an important determinant of psychosocial reaction was the perceived cause. Human actions, particularly governmental decisions, are the perceived cause of the dump hazard; radon gas in homes is perceived as a naturally occurring situation.

SUBJECTS: Subjects were 73 Warwick residents who returned a questionaire mailed to their homes. There were 20 males and 53 females with a mean age of 44. They represented a wide range of educational achievement from some high school to graduate and professional degrees, with approximately 50% obtaining less than an undergraduate degree and 50% obtaining an undergraduate degree or higher. They had resided in Warwick an average of 20 years. There were no children in 47% of the homes, while the rest of the

homes included 1 to 5 children with a mode of 2.

PROCEDURE: A one page questionaire was developed to assess attitudinal and psychological information regarding the two potential toxic threats to Warwick residents. It began with a brief introduction to the purpose of the study and identified the researcher, including an invitation to call with questions the subjects might have. It was organized so that questions about each of the situations were worded in parallel, with identical response alternatives. Subjects were to check off their responses and fill in demographic information. In addition they were invited to include any comments they had on the back of the sheet.

The questionaire was sent to 270 households randomly selected from the Warwick phone directory, addressed to "residents of:". A self-addressed envelope was included. Of the 270 questionaires, 11 were returned undeliverable and 73 completed questionaires were returned, for a return rate of 28.2%.

Major experimental hypotheses of the study are based on the perceived cause of the potential toxics. It was expected that since the radioactive dump was

regarded as a potential hazard due to human action, in comparison to the naturally occurring hazard, subjects would be more concerned about it, would regard it as more dangerous, would be more emotionally aroused (particularly angry) about it, would be more aware of the problem, and would rate government handling of the issue as poorer. Another purpose of this study was to obtain descriptive data to clarify public opinion and behavior regarding these problems.

RESULTS: Subjects had been asked to check to asked off their reaction to the proposed radioactive dump. The overwhelming majority reported being opposed to the dump. The remaining respondents reported being indifferent; none indicated that they were in favor. The means of their likert item responses were in the portion of the scale that showed them to be "very" aware of the proposed dump, "highly concerned" about it, viewing it as "highly" dangerous, and rating government handling of the situation as "poor."

Subjects had also been asked to indicate whether they had tested their homes for geologically-originating radon. Few residents (4%) indicated that they had done so. Most (55%) simply checked off that they had not, while the remaining 41% checked "no, but

considering it." The mean likert levels for all subjects showed that they were "moderately" aware of naturally-occurring radon, were "moderately concerned" about it, saw it as "very" dangerous, and rated government handling of the issue as "poor."

Dependent t-tests were performed on subjects' responses across the two toxic situations to assess the hypotheses concerning source of contamination. As predicted, subjects viewed the dumped toxic as more dangerous than the naturally-occurring toxic ($t(n69) = 5.30$, $p < .001$). They were both more aware ($t(n73) = 4.53$, $p < .001$) and more concerned ($t(n72) = 4.74$, $p < .001$) about the dump situation. In addition they rated government handling of the dump as poorer than government handling of the natural radon problem ($t(n61) = 3.22$, $p < .01$).

Subjects also differed in their emotional reactions to the dumped vs. geographically-originating radon. Subjects had been presented with identical checklists of emotions and asked to check off the emotions they had felt about each of the toxic situations. They checked more total emotions in relation to dumped radon than in relation to natural radon (dumped mean = 3.0, natural mean = 1.9, $t(n72) =$

7.34, $p < .001$). Table 1 shows the number of respondents that checked each emotion regarding each situation. Note that significantly more subjects indicated that they felt angry, upset and furious about the dumped toxic than about the natural toxic.

IMPLICATIONS AND CONCLUSIONS: Subjects' responses indicated that they did view each of the toxic situations as a potential danger about which they were concerned. On a checklist of emotions, they tended to use the more intense emotions to describe their reactions, rather than those which would have suggested that they minimized the problems. The assumption that most had not tested their homes for naturally-occurring radon was confirmed. As a result, at the time they completed the questionaire, respondents likely viewed each of the toxic contaminants as a potential risk to which they could be exposed.

At the same time, one of these risks was naturally-caused while the other was man-made. Subjects considered the man-made risk to be potentially more dangerous, and of greater concern. They were also more emotionally aroused by the man-made hazard, particularly endorsing emotions

indicating that they were upset and angry regarding it. These findings support the hypothesis that perception of human causation leads to greater distress and anger than does perception of natural causation. Also the fact that differences in affective arousal appeared for highly negatively charged emotions suggests that there is greater potential for longterm stress reactions from the anticipated dump.

Although most respondents did not know if they had a problem with naturally-originating radon, their lack of knowlege did not negate the possibility that the gas was currently in their homes. Thus their lower levels of expressed distress might in part have been due to denial. Evidence for some use of this defense is that so few subjects have tested their homes, preventing themselves from even knowing if remediation is warranted.

Responding residents may have been more aware of the dump because while both issues received media exposure, the coverage of the dump was more extensive and emotional. At the same time, it is possible that media coverage of the dump reflects the psychological reactions of the questionaire respondents, but on a

societal level. While subjects rated government handling of both situations in the "poor" range, there was a significant difference in their means, falling much closer to a "very poor" rating in the dump situation. Thus the anger expressed by these subjects and in the media may be evoked by the presence of an object of blame.

References

Baum, A.T., Gatchel, R.J., & Schaeffer, M.A. (1983). Emotional, behavioral, and physiological effects of chronic stress at Three Mile Island. Journal of Consulting and Clinical, 51, 565-572.

Edelstein, M. (1986). Psychosocial impacts of toxic exposure: an overview.
761-775.

Gibbs, M. (1986). Psychological impacts of toxic exposure.
805-815.

Levine, A.G. (1982) Love Canal: Science, Politics and People. Boston: Lexington Books.